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A SERIES OF FOUR CASES OF

INFANTILE GANGRENE OF THE CORNEA

IN WHICH THE TREPONEMA PALLIDUM WAS FOUND

BY

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A SERIES OF FOUR CASES OF INFANTILE GANGRENE OF THE CORNEA IN WHICH THE TREPONEMA PALLIDUM WAS FOUND.

It is singular that although the treponema pallidum has been found in syphilitic lesions in almost every part of the body yet specific ailments of the eye appear to form almost an exception to the rule. At all events, few reports are to be found in literature concerning the treponema in those diseases, which are amongst the commonest affecting the eye. This paucity, however, is more apparent than real. It is due partly to the inaccessibility of the lesions, involving, as they mostly do, the deeper parts of the eye, and partly to the fact that ocular pathology has become almost as much a specialty as ophthalmic surgery itself, with the consequence that lesions of the eye do not as a rule receive as much attention from the general pathologist as would otherwise doubtless be the case. At the same time there can be little doubt, if any, that in the eye, as elsewhere, the organism is the cause of all the so-called specific lesions with which we are clinically familiar.

If we glance for a moment at what has been done in the finding of the treponema in syphilitic affections of the eye this is what we find. Putting aside experimental syphilis in the eyes of apes, rabbits, and dogs as not exactly germane to the present subject, the number of observations so far placed on record can only be characterised as remarkably few. For example, the treponema pallidum has been found in primary syphilitic sores of the eyelids by Kowalewski [1] and by

[1] Klinisches Monatsblatt für Augenheilkunde, 1905, Band ii., p. 489.

Chaillous[2]; in chancre of the conjunctiva by Aubineau[3]; in recent syphilitic papules of the iris by Kruckmann[4]; in acute syphilitic irido-cyclitis by zur Nedden[5] and myself[6]; and, lastly, in keratomalacia by the present writer.[7] That the foregoing list is a scanty one will be at once realised when it is considered how relatively common are specific affections of the eye.

The object of the present paper is to communicate the details of a series of four cases of keratomalacia, in all of which the treponema pallidum was found in scrapings from the necrotic corneæ when stained by appropriate methods. For the benefit of non-ophthalmic readers it should perhaps be explained that keratomalacia is a grave affection of the cornea, apt to supervene in babies whose vital resistance has been seriously reduced by general illness, such as congenital syphilis, tuberculosis, or ileo-colitis. It corresponds with "Hikan," a disease that appears epidemically in Japan during the three so-called "diarrhœa months" (July to September); to the South American "ophthalmia Braziliana"; and to the destructive keratitis common in Russia during the great Lenten fast. Although few cases (not more than a dozen all told) have been reported in England, yet those attached to children's hospitals see the disease not very infrequently. In London keratomalacia has a distinct seasonal incidence. Thus, on a particular date in September, 1905, I had no fewer than six cases under my care—namely, one at the Evelina Hospital and five at the North-Eastern Hospital for Children. The majority of the cases had resulted from ileo-colitis, a disease, as everybody knows, more or less epidemic in London during the months of June, July, and the early part of August. It then diminishes in September and usually ends in October.

Cases of keratomalacia are characterised—first, by athrepsia, and, secondly, by a sloughing condition of one or both corneæ, associated with but slight symptoms of local reaction, such as redness, reflex blepharospasm, or swelling of the eyelids. Curious, dry, frothy-looking patches of xerosis (first described by von Graefe) may sometimes be found in the ocular conjunctiva. They are not essential to

[2] Recueil d'Ophtalmologie, July, 1907.
[3] Annales d'Oculistique, July, 1907.
[4] Axenfeld's Die Bakter. in der Augenheilkunde, 1907.
[5] Ber. der Oph. Gesellschaft, Heidelberg, 1906, p. 215.
[6] Ophthalmoscope, June, 1907.
[7] Ibid., March, 1907.

the diagnosis. The necrosis of the cornea, contrary to what might be expected, is not due to any particular micro-organism. Practically any pyogenic microbe, other conditions being favourable, may cause keratomalacia. In my own cases I have found staphylococcus albus, aureus, and citreus, as well as pneumococcus, bacillus coli, and, of course, the xerosis bacillus or, as it is more happily called, the bacillus communis conjunctivæ (A. Lawson). Keratomalacia often leads to destruction of the cornea and, if the cause in the shape of some general illness cannot be grappled with, to the death of the patient, usually from broncho-pneumonia. The facts of my four cases, all of which were seen at the North-Eastern Hospital for Children, London, are as follows.

CASE 1.—The patient, a male, aged seven weeks, was admitted on Oct. 11th, 1906, and died on the 22nd. He was the youngest of eight children, of whom four survived ; there had been two miscarriages in addition. The infant, who was born at term, remained well until he was five weeks old, when he began to waste, "snuffled," and developed a rash upon the face and buttocks. On admission, he was found to be a miserable-looking, "snuffling" infant, and weighed (nude) 8½ pounds. There were extensive copper-coloured rashes and superficial ulcerations on the buttocks, thighs, face, and angles of the mouth. The right eye showed merely a slight inflammation of the conjunctiva, such as is not infrequently present in syphilitic babies during the eruptive stage. The left cornea, however, was covered with an ash-grey slough, through the lower part of which a protrusion of Descemet's membrane (keratocele) could be recognised. On Oct. 18th the right cornea was affected and it was noted as an unusual feature of the case that dry, white, patches of xerosis were present upon the conjunctiva of both upper and lower lids. The baby, who had the hoarse and raucous cry characteristic of a syphilitic infant, was extremely ill, although the skin eruptions were fading and the cutaneous ulcerations were healing. On the 19th the right cornea looked as if it had been cauterised with silver nitrate—it was of ashen hue, with an irregular and gibbous surface. The child died on the 22nd. Treponemata were found in scrapings from both the corneæ, taken on several different occasions.

CASE 2.—The patient, a male, aged nine months, was admitted on Feb. 7th, 1907, and was discharged on

April 5th. The left eye was stated to have been bad for one month. The signs of congenital syphilis included frontal bosses, "snuffles," depressed bridge of nose, and a subcutaneous gumma of one thigh. A sloughy and unhealthy-looking ulcer of large size occupied the central parts of the left cornea, but no marked reaction such as redness or watering of the eye was present. He weighed 10½ pounds. On Feb. 14th the notes stated that towards the centre of the lower third of the left cornea was a small ulceration, through which Descemet's membrane protruded when the baby cried. On the 21st the child's general condition was better and the corneal ulcer was healing. On March 14th the left cornea showed a leucoma, to which the iris was adherent, in its lower third, and a small anterior pyramidal cataract was likewise present. The child was discharged on April 5th and he then weighed 11¾ pounds. On Feb. 13th, under chloroform, scrapings were taken from the left cornea and were handed over to Dr. W. A. Milligan, pathologist to the hospital, for examination. Dr. Milligan reported: "There are to be seen delicate screw-like rods resembling the spirochæta pallida." The observation was repeated on the 21st. Similar results were obtained independently by myself.

CASE 3.—This patient was an infant, aged three months, in whom the syphilitic manifestations included athrepsia, coryza, slight enlargement of the spleen and liver, and a few small ulcerated papules about the anus. The corneæ were practically destroyed and the eyes were in a condition of incipient panophthalmitis when the baby was seen by me. The treponema pallidum was found in scrapings from the diseased corneæ. A microscopical field could seldom be examined without coming across one or more of the micro-organisms.

CASE 4.—The patient, a male, aged three months, was admitted on July 11th, 1907, and died on the 28th. The family history showed that three children were born dead, one at seven, one at eight, and one at nine months. The fourth baby, a girl, wasted from the first, and both eyes were affected, probably with opthalmia neonatorum, on the fourth day. She died when four months old. The personal history of the patient was as follows. He was born "a fine baby" but had wasted since he was three weeks old. He had been subject to vomiting after his bottle for the previous three

weeks. There had been no diarrhœa. It had been noticed by the mother that the boy's eyes had been inflamed for five days and that for two days "a white film" had formed over the left eye. When admitted the child was wasted, cried continually, and "snuffled" loudly. His weight was 7½ pounds and his temperature was 97·6° F. There were ulcerated condylomata around the anus. The umbilicus showed a dry ulcerated surface overlying a thickened mass, probably a gumma. The spleen and liver were palpable. The infant was jaundiced. There was a sanious watery discharge from both eyes, especially from the right. An examination under chloroform showed that the corneæ were surrounded by a glistening ring of xerosis, slightly wider at the inner and outer side than elsewhere. Again, the ocular conjunctiva was of characteristic silvery appearance, was dry, wrinkled, and could be readily pinched up. The right cornea was tolerably clear except for a purulent infiltration in its upper-inner quadrant. A large part of the left cornea was occupied by a purulent focus, made up of two divisions—a larger one below and to the inner side and a smaller one to the outer side at a somewhat higher level. None of the cornea was clear. There was no swelling of the lids or other evidence of inflammatory reaction. On July 18th the right cornea was occupied by a greyish-yellow slough and there was a bulging dark spot in the lower-outer quadrant representing a keratocele. The left cornea was in a similar but even more desperate condition. Evidences of inflammatory reaction were conspicuous by their absence. The navel had healed. The general condition of the child had not improved. On the 26th the baby had developed a well-marked papular eruption of a dull-red colour over the body and limbs. The papules averaged one-eighth of an inch in diameter. He took food badly, "snuffled," and was getting weaker. He died from exhaustion on the 28th. No necropsy was held. On July 12th Dr. Milligan reported staphylococcus pyogenes albus in a tube of agar-agar smeared with secretion from one cornea. On the 14th an examination of smears for the spirochæta pallida reported negative On the 25th, however, staphylococcus albus on agar-agar and spirochætæ were found in smears treated by the Giemsa plan.

Remarks.—In four cases of keratomalacia, then—that is to say, in all that were examined—the spirochæta pallida, or an organism morphologically not to be distinguished from it, was

demonstrated in smears from the affected corneæ when stained by the Giemsa and the Proca Vasilescu method. I may say in passing that in my experience the latter yields the clearer microscopical pictures. The pathological observations were made independently by Dr. Milligan and myself and our findings agreed in each instance. From the diagnostic point of view the discovery of the spirochæta was useful in Case 3, where the syphilitic nature of the process was not of an altogether conclusive character. In the other cases, however, the specific nature of the corneal gangrene was placed beyond reasonable doubt by the associated clinical symptoms altogether apart from the results of the bacterioscopic examination.

Finally, it should be pointed out that spirochætæ have been found in the tissues, as the cornea, iris, and ciliary body, of seemingly unaffected eyes of syphilitic fœtuses and babies by Peters,[8] by Gierke and Stock,[9] by Bab,[10] by Schlimpert,[11] and, lastly, by myself.[12] These observations naturally raise the question whether the spirochætæ observed by me and described in the present communication would not have been found in the cornea of the patients apart from the existence of keratomalacia. With regard to this point I am prepared to express no opinion.

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[8] Klinisches Monatsblatt für Augenheilkunde, August, 1906.
[9] Ibid.
[10] Deutsche Medicinische Wochenschrift, Nov. 29th, 1906.
[11] Ibid.
[12] Ophthalmoscope, June, 1907.